

**DEPARTMENT OF TRANSPORTATION****DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:**Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-003559**Date Inspected:** 01-Aug-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 2330**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Wang Zhen Hua**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG Assembly**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector Robert Vatcher arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, for the purpose of monitoring welding and fabrication of the San Francisco / Oakland Bay Bridge (SFOBB) components. The QA Inspector observed the following: The weather today is 27C, partly cloudy with winds south east & increased at 32 kph.

**Orthotropic Box Girder (OBG) Fabrication**

QA arrived at OBG Bay 1 at 0000 hrs. for the purpose of witnessing Production Monitoring Tests (PMT) in accordance with WPS B T 2342 U1 (Urib) -3 combination GMAW/ SAW on closed rib deck plates. Gantry number 1 will be utilized for these tests conducted on this date. As well these PMT's will be directly associated with Deck Plates DP 577-001, DP572-001, DP587-001 & DP587-002. Tacking was performed prior to QA arrival as well as Magnetic particle Testing (MT) for the associated tack welds. QA did observe that all three sections equaling to a total of six joints had intimate contact between the closed rib plates and the associated base plate material.

QA observed ZPMC QC Sun Bo and AB/F QC Wang Zhen Hua personnel were available for this operation. As well the following welders were available and assigned to the corresponding horizontal welding positions;

Welder ID for Gantry 1 Operator – Li Xide 201492

Welder ID for Gantry Weld 1- Zhang Shao Hui 059403

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Welder ID for Gantry Weld 2- Chen Jie 059468

Welder ID for Gantry Weld 3- Xiang Huang Feng 059406

Welder ID for Gantry Weld 4- Xiang Jie 059378

Welder ID for Gantry Weld 5- Gao Xin Dong 059361

Welder ID for Gantry Weld 6- Jiang Ting Guang 062265

As welding began the following measured parameters were as follows;

### GMAW

	AMPS	VOLTS	Travel Speed
1.	378	30.4	532 mm
2.	368	30.2	Per Minute
3.	371	30.2	Constant
4.	363	30.2	
5.	368	30.0	
6.	386	30.5	

Grinding of the root passes commenced at this time. Upon grinding QA performed a visual examination of all the root passes. QA also observed ZPMC QC Sun Bo and AB/F QC Wang Zhen Hua personnel perform the same.

### SAW

	AMPS	VOLTS	Travel Speed
1.	676	25.0	515 mm
2.	681	25.1	Per Minute
3.	693	25.6	Constant
4.	687	25.3	

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5. 685 25.3

6. 681 25.2

Visual- QA observed ZPMC QC Sun Bo and AB/F QC Wang Zhenhua ZPMC perform a 100% visual examination (VT) on DP 577-001, DP572-001, DP587-001 & DP587-002 represented specimens. As well QA performed a visual exam of all six joints. QA concurred with QC assessment that all six joints appeared to conform with the contract documents. QA observed that it appeared that no cracks, overlap, under sizing or over sizing, undercut nor incomplete fusion were apparent.

Ultrasonic Testing (UT)- commenced & observed by QA. ZPMC UT personnel Ma Ji Long performed UT for depth of penetration who accepted all six joints by UT method. QA observed the calibration performed by ZPMC UT personnel as well as the UT of all six joints. QA observed that no signals representing lack of penetration appeared during these observations.

QA observes QC representative ZPMC QC Sun Bo and ABF QC Wang Zhen Hua conduct measuring of the macro etched specimens

Deck Plates	Depth of Penetration	Tack Weld Location	Penetration < 80%
577 1-1	>/=12.0 mm		
577 1-2	>/=12.0 mm		
577 1-3	>/=12.0 mm		
577 2-4	10.0 mm		
577 2-5	11.2 mm		
577 3-1	11.75 mm		
577 3-2	10.2 mm		
577 3-3	>/=12.0 mm		
577 4-4	10.0 mm		
577 4-5	>/=12.0 mm		
577 5-1	>/=12.0 mm		
577 5-2	>/=12.0 mm		
577 5-3	>/=12.0 mm		
577 6-4	10.2 mm		
577 6-5	11.25 mm		

All were accepted by ZPMC QC Sun Bo and ABF QC Wang Zhen Hua. QA conducted a measurement of all the specimens utilizing a loupe with a straight edge line and (10) 1.0 mm increments, concurring with the QC assessment and concluded that all the specimens had a depth of penetration greater than 80%.

The above mentioned items pertaining to the Production Material Testing (PMT) and associated macro etch specimen measuring appears to conform to the contract documents.

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### Bay I

QA observed multiple ZPMC personnel performing tasks associated with Deck Panels. QA observed the performance of Magnetic Particle Testing (MT) by MT Level II Bo Ting Rui on piece mark DP572-001. 100% of all the tack welds were examined. AB/F representative Wang Zhen Hua mentioned that 27 tack welds were identified as having linear indications that were repaired and deemed acceptable by the MT method.

As well Mr. Li Le Chang was observed manually cutting the waste ends by the oxy-acetylene flame cut method on deck panel DP558-001.

QA performed WPS verification for weld joint NSD1-SA76A/H-57A to WPS -B-T-2221-B-U3C-S-2 (SAW) in the flat position. Welding operator Chen Hongxia id number 040460. Measured parameters were as follows; Preheat verified at 110C, voltage -33.7, Amperage-685.0 utilizing electrode positive with 4.8 mm diameter wire. Travel speed 610 millimeters per minute. ZPMC QC inspector (CWI) onsite is Zhang Huang and the AB/F QC inspector is Liu Cheng. QA observed QC verify all the above parameters as well utilizing appropriate amp gauges and temperature sticks as well.

QA performed WPS verification for multiple weld joints on piece marks SSD1-SA159A/E/J-2, SSD1-SA159A/F/J-2 - SSD1-SA159A/G/J-2 to WPS-B-T-2332-TC-P5-F (FCAW) in the Horizontal position. Welding operators names are as follows; Ren Zongbin id number 067037, He Zhongliang id number 066165, Ni Haibing id number 201228 & Chang Chuancang id number 053870. Measured parameters were as follows; Preheat verified to below 110C. QA alerted QC representative Xu Le Feng prior to the FCAW arc reaching the affected location and Mr. Feng ceased all welding operations upon verifying that the preheat temperature was below the designated WPS required heat. Voltage -31.5, Amperage-298.0 utilizing electrode positive with 4.8 mm diameter wire. Travel speed 300 millimeters per minute. ZPMC QC inspector (CWI) onsite is Xu Le Feng and the AB/F QC inspector is Liu Cheng. QA observed QC verify all the above parameters as well utilizing appropriate amp gauges and temperature sticks as well.

The above mentioned items as observed by QA appear to be in conformance with the contract documents.

### Summary of Conversations:

No relevant conversations this date.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Ady Velasco 138-1694-2685, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Vatcher,Robert
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Quality Assurance Inspector
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<b>Reviewed By:</b>	Cuellar,Robert
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QA Reviewer
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